Prevalence of HIV Antibodies in Transsexual and Female Prostitutes

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ABSTRACT

Human immunodeficiency virus (HIV) prevalence was studied in an unselected group of 216 female and transsexual prostitutes. Subjects were asked about age, biological sex, marital status, children, length of occupation, sexual practices, and drug abuse history. Blood was drawn on site.

All 128 females who did not admit to drug abuse were seronegative; 2 of the 52 females (3.8%) who admitted to intravenous drug abuse were seropositive. In contrast, 11.1% of the 36 male transsexuals (including 3 out of 32 non–drug abusers) were seropositive.

The results support the notion that vaginal transmission of HIV is less effective than anal transmission. (*Am J Public Health.* 1992;82:590–592)

Introduction

We report the initial results of a survey aimed at defining the prevalence of human immunodeficiency virus (HIV) seropositivity in a population of transsexual and female prostitutes working side by side. To the best of our knowledge no data on HIV infection among transsexuals is available.

Method

During a 36-month period, a multidisciplinary team manned a van that visited the major location of open prostitution in the Tel Aviv area, located on a northern beach of the city. To cover as wide a proportion of the prostitute population as possible, we visited the locale at different hours of the day approximately once every 6 weeks during the first year and approximately every 6 months subsequently. Although prostitution is not legal in Israel, the laws against it are not usually enforced. According to unofficial police estimates, the study covered at least 70% of Tel Aviv prostitutes known to the police.

During each visit a short demographic questionnaire was filled out by an interviewer. Informed consent was also obtained. The questions asked included questions about age, sex, marital status, number of children, years on the job, intravenous drug abuse (IVDA), and sexual practices.

As reported by the study subjects during the interviews, the Tel Aviv transsexual prostitute community is considered to comprise between 35 and 40 persons who practice prostitution in the same locale. These are biologically born males who live and dress as women. Most of them have either undergone castration or are in the process of getting ready to have such an operation. They are indistinguishable physically from the female prostitutes and share the same client population. They all reported being on continuous estrogen maintenance. About 25% of those interviewed reported a sex-change operation that included the forming of an artificial vagina.

A sample of blood was drawn on site, and specimens were transferred to the Chaim Sheba Medical Center laboratories. All serum samples were tested blindly for antibodies to HIV by a commercial enzyme-linked immunosorbent assay (ELISA kit, ELAVIA, Institute Pasteur, France). All sera found to be positive by ELISA were confirmed by an immunoblot assay (Western blot technique) using a commercial kit (Dupont Biotech Research Laboratory, Ind., USA), interpreted according to the supplier's instructions.

Results

The 216 individuals examined included 180 biological women and 36 transsexuals who had been born males. Twenty-six percent of the females and 10.3% of the males reported previous or current IVDA. All of the biological males admitted to anal intercourse at some time during their sexual lives. In contrast, less than 10% of the female prostitutes admitted to having engaged in anal intercourse.

For the total group, ages ranged between 18 and 57, with a mean of approximately 30 years. There was no difference in mean age between females who admitted to drug abuse, the rest of the female group, and the transsexuals.

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Fifty percent of the females and 42.9% of the males had practiced prostitution for 5 years or longer; 22.9% and 28.6%, respectively, had practiced it for more than 10 years. There was no difference in length of occupation between females who reported IVDA and those who did not. Condoms were used by both sexes during the study period. More detailed information on the frequency of this practice could not be obtained.

Table 1 presents the numbers and percentages of seropositive subjects by biological sex and reported history of drug abuse. Close to 11% of the transsexuals were found to be HIV positive, as compared with only 1.1% of the total group of females. Breakdown by drug abuse history shows that 3.8% of the females who admitted to IVDA were HIV positive. *All* females who denied a history of IVDA were seronegative. Among the transsexuals, there were 3 seropositive among the 32 who did not admit to IVDA. The differences between the transsexuals and the females are significant at the $P < .01$ level by Fisher's Exact Test.

To estimate the effect of IVDA and gender, data were stratified by these variables. The odds ratio for female gender was 20.8 (90% confidence interval, 4.4–101.7); the odds ratio for IVDA was 7.3 (90% confidence interval, 1.6–34.3).

TABLE 1—Age Distribution of the Study Population and Percentage Seropositive, by Sex and Drug Abuse

Category	Age				Seropositive	
	n	Mean	SD	Range	n	%
Females, no drugs	128	31.1	7.5	19–54	—	0.0
Females, drug history	52	28.1	5.9	19–40	2	3.8
Total females	180	30.2	7.2	19–54	2	1.1
Males	36	31.0	9.6	18–57	4	11.1

Note. Age was unclear in 1 female and 3 males.

Discussion

HIV has been isolated from genital secretions as well as from genital ulcers, saliva, semen, and seminal plasma of AIDS patients.[1–8] Yet, although the male to female route has never been disputed,[9–12] the exact mechanism of transfer has not been fully established.

The discrepancy between male and female prostitutes working side by side suggests that female prostitutes who are not drug abusers may be at less risk for HIV transmission than are transsexuals. There are a number of possible reasons for this discrepancy: a lower frequency of condom use, a possible increase in efficiency of transmission of HIV by an artificial vagina in the transsexual population (e.g., more friable mucosa), and a possible role of estrogen replacement. Still, most of the subjects in both the male and female groups reported full use of condoms at the time of the study.

The fact that all of the seropositive women admitted to drug abuse is in line with other studies of prostitutes in Western societies. A thorough search of recent literature fails to demonstrate unequivocal seropositivity among British,[13] French,[14] German,[15] Italian,[16] or Dutch[17] prostitutes without drug histories. In Greece,[18] 6% of 200 prostitutes examined were reported to be seropositive; however, their lack of drug histories may be questioned. In the same context, 5% seropositivity was observed among female prostitutes seen in selected venereal disease clinics in the United States.[19–21] Yet anal intercourse, genital ulcers,[21] or direct vaginal seminal contact[22] were not ruled out.

The data are also compatible with the rarity of female-to-male transfer of HIV,[22–28] and they may raise the question of whether female infection occurs primarily outside the vaginal route. Even if some of the prostitutes had falsely denied drug abuse, the resulting misclassification would have led to a bias in the opposite direction. Unfortunately, no male partners of these female prostitutes could be included in the study. To address the question of their infection status, one would have to prospectively follow a group of male partners sexually exposed to HIV-infected prostitutes. This mission would have been impossible to accomplish in a population that volunteered to participate in a study that promised anonymity. Because the transsexuals had more anal contacts in their pasts than did the female prostitutes, our findings may suggest that vaginal transmission of HIV is less effective than anal transmission. On the other hand, the role of more effective barrier precautions taken by some of the female prostitutes cannot be ruled out. □

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References

1. Friedland GH, Klein RS. Transmission of the human immunodeficiency virus. *N Engl J Med.* 1987;317:1125–1135.
2. Archibald DW, Witt DL, Craven DE, et al. Antibodies to human immunodeficiency virus in cervical secretions from women at risk for AIDS. *J Infect Dis.* 1987;156:240–241.
3. Archibald DW, Zon L, Groopman JE, et al. Antibodies to human T-lymphotropic virus type III (HTLV-III) in saliva of acquired immunodeficiency syndrome (AIDS) patients and in persons at risk for AIDS. *Blood.* 1986;67:831–834.
4. Vogt MW, Witt DJ, Craven DE, et al. Isolation patterns of the human immunodeficiency virus from cervical secretion during the menstrual cycle of women at risk for the acquired immunodeficiency syndrome. *Ann Int Med.* 1987;106:380–382.
5. Kreiss JK, Coombs R, Plummer F, et al. Isolation of human immunodeficiency virus from genital ulcers in Nairobi prostitutes. *J Infect Dis.* 1989;160:380–384.
6. Zagouri D, Bernard J, Leibowitz J, et al. HTLV III in cells cultured from semen of two patients with AIDS. *Science.* 1984;226:449–451.
7. Ho D, Byington RE, Schooley RT, et al. Infrequency of isolation of HTLV-III virus from saliva in AIDS. *N Engl J Med.* 1985;313:1606.
8. Guinan ME, Hardy A. Epidemiology of AIDS in women in the United States—1981 through 1986. *JAMA.* 1987;257:2039–2042.
9. Stewart GJ, Tyoer JPP, Cunninghan AL, et al. Transmission of human T-cell lymphotropic virus type III (HTLV-III) by artificial insemination by donor. *Lancet.* 1985;2:581–585.
10. Pitchenik AE, Shafron RD, Glasser RM, Spira TJ. The acquired immunodeficiency syndrome in the wife of a hemophiliac. *Ann Int Med.* 1984;100:62–65.
11. Fischl MA, Dickinson GM, Scott GB, et al. Evaluation of heterosexual partners, children and household contacts of adults with AIDS. *JAMA.* 1987;257:640–644.
12. Piot P, Plummer EA, Mhala FS, Lamboray JL, Chin J, Mann JM. AIDS: An international perspective. *Science.* 1988;239:573–579.
13. Barton SE, Underhill GS, Gilchrist C, et al. HTLV-III antibody in prostitutes. *Lancet.* 1985;2:1424.

14. Brenky-Faudeux D, Fribourg-Blanc A. HTLV-III antibody in prostitutes. *Lancet.* 1985;2:1424.
15. Smith GL, Smith KF. Lack of HIV infection and condom use in licensed prostitutes. *Lancet.* 1986;2:1392.
16. Tirelli U, Vaccher E, Carbone A, et al. HTLV-III antibody in prostitutes. *Lancet.* 1985;2:1424.
17. Coutinho RA, van der Helm TH. Geen aanwijzing voor LAV/HTLV-III onder prostituees in Amsterdam die geen drugs gebruiken. *Ned Tijdschr Geneeskd.* 1986;130, no. II.
18. Papervangelou G, Roumeliotou-Karaysonis A, Kallinkos G, Papoutakis G. LAV/HTLV-III infection in female prostitutes. *Lancet.* 1985;2:1018.
19. Antibody to human immunodeficiency virus in female prostitutes. *JAMA.* 1987;257:2011–2013.
20. Redfield RR, Markham PD, Salahuddin SZ, et al. Heterosexually acquired HTLV-III/LAV disease (AIDS-related complex and AIDS). *JAMA.* 1985;254:2094–2096.
21. Marmor M, Weiss LR, Lyden M, et al. Possible female-to-female transmission of human immunodeficiency virus. *Ann Int Med.* 1986;105:969.
22. Wykoff RF. Female-to-male transmission of HTLV-III. *JAMA.* 1986;255:1704–1705.
23. Stoneburner RL, Chiasson MA, Weisfuse IB, Thomas PA. The epidemic of AIDS and HIV-1 infection among heterosexuals in New York City. *AIDS.* 1990;4:99–106.
24. Schultz S, Milberg JA, Kristal AR, Stoneburner RL. Female-to-male transmission of HTLV-III. *JAMA.* 1986;255:1703–1704.
25. Polk FB. Female-to-male transmission of AIDS. *JAMA.* 1985;254:3177–3178.
26. Ross MW. Prevalence of risk factors for HIV infection in the Australian population. *Med J Australia.* 1988;149:362–365.
27. Cameron DW, Simonsen JN, D'Costu LJ, et al. Female to male transmission of human immunoefficiency virus: risk factors for seroconversion in men. *Lancet.* 1989;2:403–407.
28. Padian NS, Shiboski SC, Jewell NP. Female to male transmission of human immunodeficiency virus. *JAMA.* 1991;266:1664–1667.

Predictors of Condom Accessibility among Hispanics in San Francisco

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ABSTRACT

Ready access to condoms can be an important means of slowing the spread of sexually transmitted diseases and human immunodeficiency virus. We identified the factors associated with keeping or carrying condoms in a random-digit dialing survey of 522 Hispanic adults aged 18 to 65 years in San Francisco. Overall, more Hispanic men reported having condoms than Hispanic women (55.2% vs 23.8%). Hispanic men also reported much higher levels of risky sexual behavior than Hispanic women. Condom promotion efforts with Hispanics will require different approaches for each gender. (*Am J Public Health.* 1992;82:592–595)

Introduction

Sexually transmitted diseases (STDs) and acquired immunodeficiency syndrome (AIDS) are major health problems for Hispanics in the United States. While Hispanics make up approximately 8.5% of the population of the United States, they account for over 15% of AIDS cases,[1] and the incidence of AIDS attributable to heterosexual contact is 4 times higher for Hispanic men and 11 times higher for Hispanic women than for non-Hispanic Whites.[2] Currently, the rates of gonorrhea, syphilis, and chancroid are all many times higher for Hispanics than for non-Hispanic Whites in the United States.[3–5]

Appropriate condom use is an important method of preventing the spread of human immunodeficiency virus (HIV) and other STDs among Hispanics. Rates of condom use among married women, including Hispanics, remain low,[6] and rates of use for unmarried Hispanics are rarely reported. To explore and describe the demographic, attitudinal, and behavioral factors associated with condom use among Hispanics and to identify areas that should be emphasized in health education campaigns to promote condom use in this group, we surveyed a random sample of Hispanic adults in San Francisco by telephone.

Methods

Procedure

We used a modified Mitofsky-Waksberg method of random-digit dialing[7] to survey Hispanic adults in San Francisco 18 to 65 years of age. The refusal rate was 8.4%.

Measures

To assess condom accessibility, respondents were asked: "Do you keep condoms somewhere or carry them with you?" Also, they reported their frequency of condom use in the previous 12 months (always, often, sometimes, seldom, or never) and frequency of use with their primary sexual partner, with all male partners, and (in the case of men) with all female partners. Predictor variables included embarrassment (a lot or a little vs none) in buying, using, or, in the case of

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